

Abstract for
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Flying Cassini With Virtual Operations Teams

by

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The Cassini Mission to Saturn is the last very large, flagship planetary orbiter mission currently budgeted by NASA. Launched on October 15, 1997, Cassini is on a 6.7 year cruise to Saturn, flying by Venus twice, the Earth, and finally Jupiter to gain enough energy to arrive at Saturn on July 1, 2004. At Saturn, Cassini's rich complement of 12 science instruments will spend four years taking observations of Saturn's rings, atmosphere, magnetosphere, icy satellites, and large moon, Titan. Additionally, Cassini is carrying the European Space Agency's Huygens Probe mission, which has a payload of six instruments and will be deployed into the Titan atmosphere.

The Cassini Program's challenge is to fly a large, complex mission with a reduced operations budget. A consequence of the reduced budget is elimination of the large, centrally located group traditionally used for uplink operations. Instead, responsibility for completing parts of the uplink function is distributed throughout the Program. One of several strategies the Program is employing to handle this challenge is the use of Virtual Uplink Operations Teams. Virtual Teams are comprised of a group of people with the necessary mix of engineering and science skills who come together for the purpose of building a specific uplink product. These people are drawn from throughout the Cassini Program and participate across a geographically large area (from the West coast of the US to Germany), covering 10 time zones. The participants will often split their time between participating in the Virtual Team and accomplishing their core responsibilities, requiring significant coordination and time management. When the particular uplink product task is complete, the Virtual Team disbands and the members turn back to their home element for future work assignments. This time-sharing of employees is used on Cassini to build mission planning products, via the Mission Planning Virtual Team, and sequencing products and monitoring of the sequence execution, via the Sequence Virtual Team. This challenging, multitasking approach allows efficient use of personnel in a resource constrained environment.

This paper will describe in detail how the Cassini Mission Planning Virtual Team and Sequence Virtual Team concept was implemented and operates. Topics covered will include how the teams are formed, criteria for team composition, duration and products of the teams, responsibilities of the team members, coordination across multiple time zones, and empowerment of the teams. The paper will compare Cassini's Virtual Team operations to that of the more traditional style uplink operations teams of the Galileo and Voyager Projects, which are comparable in size and complexity to the Cassini Project. The comparison will focus on the team sizes, development time for similar products, the team member empowerment, productivity, and the operations costs. Finally, the paper

will give a report on how well the Cassini Virtual Teams have worked to date in flight, and lessons learned during this early cruise period will be shared.